



# the journal of college radio

FEBRUARY, 1974

WAKE FOREST  
UNIVERSITY

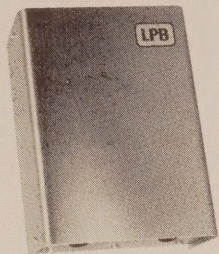
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## carrier current transmitters from **LPB**

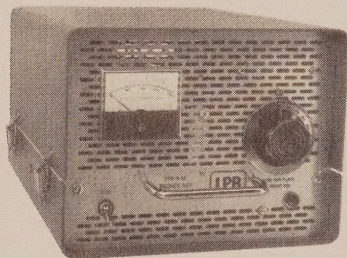
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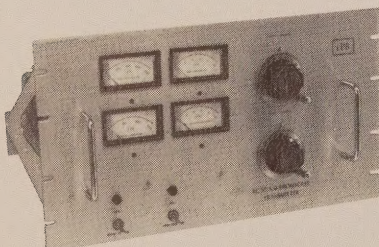
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A "cheapie" won't hold up and most campus broadcasters can't afford the high priced kind. That's where LPB comes in. We manufacture four consoles: a four channel production board, five and eight channel dual mono and full eight channel stereo. Prices range from \$475 to \$2,995. No corner cutting either ... Daven Faders, PC Board solid-state construction, large easily readable panel meters, internal cue and monitor amps and heavy duty sheet metal for durability. LPB consoles compare fully with the big and expensive brands yet cost only a fraction of their prices!

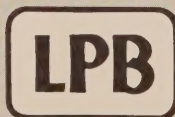
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it's our  
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# the journal of college radio

FEBRUARY, 1974  
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## ON THE COVER

Cartoon by JCR's Managing Editor,  
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Intercollegiate Broadcasting System, Inc.

**Central State University**

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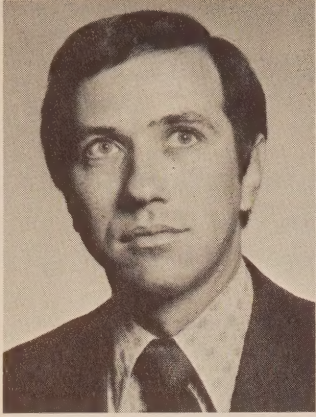
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# Publisher's Report

JACK DESKIN

The winter issue of the *Journal of Communication* has three very interesting articles which should be of interest to students of communication and behavioral researchers.

Archie Bunker and *All in the Family* may have harmful effects: that perhaps it "encourages bigots to excuse and rationalize their own prejudices," rather than providing a "cathartic reduction of bigotry."

The authors of the study, Neil Vidmar and Milton Rokeach of the University of Western Ontario and Washington State University respectively, found that frequent viewers of the show were prone to admire Archie most among the characters, and to condone his ethnic slurs significantly more than infrequent viewers.

The study, conducted with American adolescents and Canadian adults, "is clearly at variance with those who have argued that television viewers of *All in the Family* uniformly perceive the program's satirical intent."

Eli A. Rubinstein, professor of psychiatry at SUNY at Stony Brook, and editor of the five-volume research report to the Surgeon General's Scientific Advisory Committee on Television and Social Behavior, takes a look at new research challenges in "The TV Violence Report: What's Next?" "The television industry is understandably opposed to any effort which adds new controls or restrictions to its operation. But if the emphasis is on expanding the role of television for positive child

development rather than merely restricting the negative influences, this should be an incentive for media participation," asserts Dr. Rubinstein. Says the author, "A major research effort should be initiated exploring the impact of television on the very young child . . . should investigate the ways in which television reinforces social stereotypes . . . We need to know more about cross-cultural differences in television program practices, in program content, and in responses by children to these differences. We need to know more about family viewing and how family communication is influenced by those viewing patterns . . . Just as there are effective guides to reading books, there should be guides to effective television viewing." He does conclude that "eliminating what is harmful without offering a viable and positive alternative would be only half a step at best." In summation, Dr. Rubinstein states, "The potential of television as a positive socializing influence has not been realized. It is to that purpose that intensive research and policy efforts should be addressed in the future.

And finally, Marshall McLuhan has another publication entitled, "At the moment of Sputnik the planet became a global theater in which there are not spectators but only actors." Says McLuhan, "Among the unexpected features of the information revolution are the extraordinary diminution of private identity and egotistic conviction, as

a result of major involvement in the lives of other people, and the extraordinary enlargement of the public sector." The author attributes this development in part to a change in styles of reporting. "The 'old journalism' had sought objectivity; in presenting people and events it tried to achieve this by giving 'both sides' at once. To give the pro and the con, the good and the bad, has been, for a century at least, the approved way of attaining judicial balance and fairness. To give both sides, however, tends to ignore the possibility that there may be many more sides than two . . . The 'new journalism' offers not so much a view of men and events but a means of immersion in situations which involve many people simultaneously."

Linking the 'new journalism' to recent events, McLuhan points out that "The Pentagon Papers were position papers which may or may not have been studied or discussed by a Congressional committee. They are the 'news behind the news' which used to be considered muckraking but has now become an ordinary dimension of journalism . . ."

"We have moved into an age," he continues, "in which everybody's activities affect everybody else and therefore the whole matter of privacy is suspect, even as it is impractical. One result has been a relaxing of private morals (sometimes referred to as 'permissiveness') and at the same time an extraordinary new intensity in public morals. This change is well reflected in the Watergate affair."

The *Journal of Communication* is published by the Annenberg School Press in cooperation with the International Communication Association, at the University of Pennsylvania, Philadelphia, Pa.

The *Journal of Communication* may have a special rate for students such as the *Journal of Broadcasting* offers to students. Check with the new editor, George Gerbner of the University of Pennsylvania.



# PACIFICA ..

HAS the top non-commercial stations in the country;

RAISED over \$1,200,000 last year from its listeners;

BUILDS its audience every day with programs like these:



## OUR DAYS IN COURT

A survey of the laws, attitudes, and options for change that affect women in our legal system.

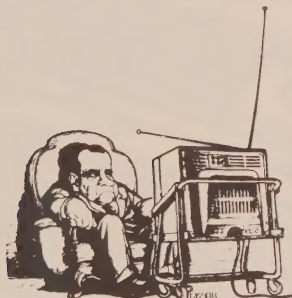
MORE INFO? CIRCLE SERVICE CARD ITEM 34.



## PARTING SHOTS

Ex-FCC Commissioner Nick Johnson uses verbal swords when speaking about the intimidation of the nation's broadcast media by the Nixon Administration.

MORE INFO? CIRCLE SERVICE CARD ITEM 36.



## HALDEMAN AND ERLICHMAN WERE FINE PUBLIC SERVANTS. . .

The thrills, the chills, the laughs, the witnesses you loved so well, all in one compendium of comic relief from the Senate Watergate Hearings.

MORE INFO? CIRCLE SERVICE CARD ITEM 35.

## THE HIP CAPITALISTS

A special report on the attitudes and practices of young, "hip" people trying to be successful entrepreneurs of records, waterbeds and natural foods.

MORE INFO? CIRCLE SERVICE CARD ITEM 37.



## POISONED POWER

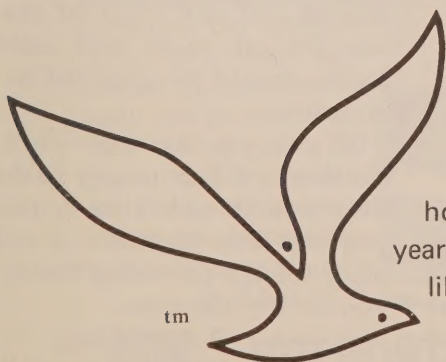
Former Atomic Energy Commission researcher, Dr. John Gofman, explains why nuclear power plants in urban areas are hazardous to your health.

MORE INFO? CIRCLE SERVICE CARD ITEM 38.

Affiliate with us and let Pacifica's 100 radio producers do for you what they do for

Pacifica stations. The five programs listed above are examples of what Pacifica Affiliates have been broadcasting recently. We want you to listen to one of these programs. Circle the service card item which corresponds with the program you want to hear, and we will send you an audition cassette. (One per station, please.)

Affiliation means broadcasting the best and most current Pacifica productions on your station. Affiliation means receiving 20 to 210 hours of provocative, informative and educational programming per year. Costs vary from \$125.00 to \$1200.00 per year. Over 70 stations like yours broadcast Pacifica programs last year. Why not add Pacifica to your air sound? For more information, *circle service card item 6.*





# IBS Chairman's Memo

**Participate - Benefit.** This succinctly states the way to gain the most for your station from its association with IBS. IBS accomplishes things for its members, but the members will gain even greater benefits by active participation in IBS affairs. There are many ways to participate. I wish to cite a few of the less obvious.

**Elections—**A nominating com-

mittee is even now preparing the slate for the election in the late spring of the board of directors. Voting member stations will be sent a ballot at that time. Use it! Vote!

**Upgrade Membership—**If your station is a conditional member and meets the requirements for voting membership (located at a higher educational institution, complies with the IBS Codes) obtain and complete the application forms for voting membership. (Member Services Department at Vails Gate, New York, has the forms.)

**Data Bank—**Forms are going out to solicit information for the IBS Data Bank. When they arrive, complete them and return them to IBS at Vails Gate. This information will

be compiled and printed out by computer and will then provide valuable information for the IBS Sales Committee (which stations carry commercials, their basic rates, the program department [type of program format], the engineering department [type of transmission, power level] and others). With this information within easy access the department managers of IBS will be able to undertake activities which will benefit the largest possible number of members.

Undoubtedly you can name several other ways to participate in IBS affairs. Fine! Don't hold back; participate! It will be to your station's benefit!

D. W. Borst



## letters to the editor...

I have been reading reports of talk by the record companies of sending our promotional copies of records, minus the record jackets.

As with most college stations, my station's budget won't allow for extra expenses such as buying record jackets for every album we receive.

I have a solution to the cardboard shortage being felt by the record companies. With the exception of WEA distribution, we receive all our records at scattered intervals in packages of one or two records. Each package has one or two layers of corrugated cardboard in it.

If the companies were to send out a batch of records, say, for example, every two or three weeks, they wouldn't waste all that extra cardboard. By lowering this waste of corrugated cardboard the companies also save money. The money and pulp saved could be

used to keep the record jackets on the records.

In addition, they would have another saving. According to the post office, the rates for commercial recordings (4th class) are sixteen cents for the first two pounds and eight cents for each additional pound. By not sending out those extra tons of cardboard each year, they would save considerable postage.

Arthur R. Blazer  
WRHO-FM

Hartwick College  
Oneonta, New York

I have just finished reading the November issue of JCR and wonder how you have the nerve to charge \$5.00 for a subscription. The November edition is a typical example of your magazine. IBS, FCC, music, book, product and engineering reports are average,

minimally researched reports, but this can slide. However, when four of your six articles include interviews with college radio stations that know nothing (like ourselves) about any facet of radio than your magazine is about as useful at the "Who's Who in . . ." books.

College radio is where we are supposed to learn—then why the hell are you constantly filling your magazine with articles on students who don't know their proverbial backsides from elbows. Instead, fill it with interviews with program directors from WGBH, WLOS, and WNET about programming educational material. Interview production people from the real world; interview people from the larger engineering companies. Topics such as station management, record companies, program material sources and any other of the endless list of radio and television topics should be included in your magazine.

If you say that you don't have the time, staff, or money to do this, then you shouldn't be in print. If you say this magazine is not the place for the preceding topics, then you are beyond hope.

Robert Flag  
WLTI

Lowell Tech. Institute  
Lowell, Mass.



the first reel to reel  
with the rugged reliability of **itc**



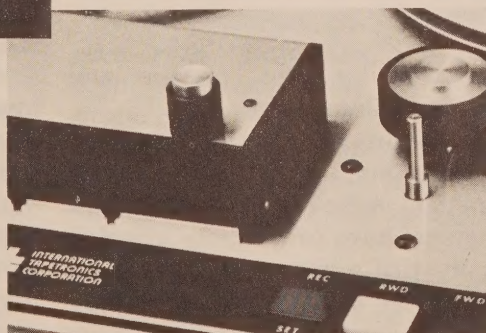
See it  
at the  
**NAB  
SHOW**

After years of concentration on building the finest tape cartridge equipment, it was inevitable that ITC would design a reel-to-reel machine with the rugged reliability that is inherent in the International Tapetronics' name. And here it is . . . incorporating all those features most wanted by broadcasters. Examples: motion sensing, multi-function edit mode, ITC's proven air damped solenoids for super quiet operation, automatic tape lifters, TTL logic circuitry, capability of handling dissimilar size reels, selective play/record synchronization, 10½" or 14" reels, 3¾ - 7½ IPS or 7½ - 15 IPS and the superior specifications you'd expect. Some of our customers are buying sight-unseen because

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MORE INFO? CIRCLE SERVICE CARD ITEM 41.



# the cross and the microphone

*by Craig Marrs*

CRAIG MARRS is the director of College Life Outreach for Scope Ministries International. He produces the religious featurette "Beautiful Day," and is the vice-president of the Inter-Religious Council of Central State University in Edmond, Oklahoma.

"Some call them Jesus Freaks, religious fanatics, extremists . . . in the first century they came to be called Christians and they are still with us in ever increasing numbers.

Attracted by the person and message of Jesus Christ . . ."

So begins another in the ever increasing number of contemporary Christian radio broadcasts. These programs have profoundly affected the lives of millions of high school and college age students. And they seem to be increasing in number and quality by leaps and bounds.

In the past few years nearly every major Christian and religious organization has been in on the

business of saving souls over the air. Indeed, it seems we have come a long way from the old "put your hand on your radio and thou shalt be saved." It will help to remember that there will be exceptions to every rule and that is especially true when you are dealing with an area that is both as esthetic and as real as the personal beliefs of man. However, no exception can replace the pure and simple facts that concern the birth, life, death, and resurrection of Jesus Christ. It is a personal experience with Christ that has prompted these young people to re-evaluate their life styles and to become transformed to the image of Christ. This transformation has pervaded every area of our society and this is especially true in the area of broadcasting.

The college-age Christian broadcaster is faced with a paradox of sorts. He is expected both to proclaim the gospel of Christ and to conform to the standards of his individual broadcasting situation. Sometimes this can be very frustrating. The trend now is to reach a happy medium where he can be free to proclaim his personal convictions and not to step on social, political, economic, and even legal toes. The result is a barrage of what has been aptly labeled as "contemporary Christian radio." This is a show, usually fifteen minutes to an hour and a half in length, which programs current gospel hits by very competent groups and individuals interspersed with dialogue and comments by students who are both Christian and non-Christian.

In many cases CCR is heard as a matter of station format rather than used as public service time to fulfill an FCC obligation. The results can be either rewarding or disastrous financially, but for those who fulfill a need in their own lives by helping others the results can be nothing but rewarding.

However, CCR has not emerged as merely a vehicle for the frustrated Christian broadcaster. The prime reason for its development is



its ability to say the message clearly, simply, and without the usual religious jargon which turns off the majority of students today. Modern Christianity is finally beginning to realize that it needs to meet young people on their own level and not expect them to ascend to the pulpit to hear the gospel message. "The approach is unique," according to Claude C. Cox, who produced the immensely popular "Powerline" for the Southern Baptist Radio and Television Commission in Fort Worth, Texas. "We are meeting the needs of young people and getting across a definite message without being preachy." Powerline's format includes Top 40 songs interspersed with comments from the host of the show, John Borders. In doing so, "Powerline" carefully walks the tightrope between secular and Christian worlds. The show also includes a feature where listener's questions concerning all the contemporary problems which face our youth today, such as drugs, sex, and interpersonal relationships, are answered either by personal mail or, for the more universal problems, answered on the air. According to Dr. J. P. Allen, director of the Commission's audience response department, when listeners hear these problems discussed "they know they are hearing a religiously-oriented show and they are responsive since we are not sneaking up on them." Cox said, "Young people are not difficult to communicate with if you are honest and straightforward."

One of the more popular theories put forth today says that all CCR programming must involve a hard gospel rock sound in order to make such programming relevant to the audience they are shooting for. However, it has been found that the most popular show involves an up-tempo and youthful sound, usually with a good rhythmic beat and lyrics whose messages are easily understood. Because of the general association of hard rock with some kind of rebellion in this country,

and because of the drug culture, some Christian programmers tend to lump all college-age students in the same category, with the same thoughts and ideas and opinions. In doing so they are actually forcing these ideas, thoughts, and opinions on these students and thereby forcing them into the youth culture they are trying to change.

Probably the most controversial trend in Christian broadcasting today is the broad basis for its diversification and categorization. There seems to be about four major categories for modern religious music.

Sacred music is the traditional sound best typified by the time-honored hymns performed by artists such as George Beverly Shea.

Gospel music has a distinctly southern and country-western flavor. Perhaps its best-known performers are the Happy Goodman Family of television's "Gospel Jubilee" series.

Easy gospel is perhaps the best way to describe the songs of artists like Bill Gaither and Doug Oldham.

Contemporary music includes the so-called "gospel rock" and "gospel soul" of singers like Randy Matthews and Andre Crouch and the Disciples.

But we don't seem to have to rely totally on religious music even in the realm of the contemporary category to portray the message of man's search for inner peace and purpose. The songs of such artists as David Gates, John Denver, and Gordon Lightfoot all have at least spiritual overtones; and, as we have seen with "Powerline," it would seem that practically all secular music can be used to show a definite need within man as a whole to search deeper for the real answers which face our society and world.

For the third consecutive year, *Billboard* magazine has awarded the Scott Ross Show as the "Best Syndicated Religious Broadcast." The program is aired on 140 U.S. stations, plus several foreign stations. This show blends con-

temporary Christian music and secular music to hit the happy medium we talked about. This show, like "Powerline," also includes testimonies and short sermons. A telephone counseling service has been set up in 10 cities where the show is aired. This typifies the tremendous response that CCR has elicited from today's youth.

As in every form of public service, there are those who take advantage of the trust placed in individuals who are in the public eye and use it for their own personal gain. However, the promoters of CCR are very rarely burdened with the responsibility of taking care of individual offerings or collections, for very rarely do these exist. Programming for the purpose of reaching the youth of the local community for the cause of Christ, they very rarely ask for money. The evangelical spirit and understanding of the youth audience doesn't require it for support of the programs.

As it becomes evident that so many of the youth of today have been totally turned off by the "Church" and what they consider to be its hypocrisy, the advent of CCR as an evangelical tool will continue to grow.

One of the problems of Christian broadcasting has always been that the quality of shows produced has been less than exciting. Again, the students who have recognized the validity of Christianity in respect to their own lives have come to the rescue. Youthful and refreshing ideas have come to light and as a result, the quality has greatly improved, both in the actual production of shows and in the way the message is presented.

No doubt there will always be those who disapprove of CCR, but for millions of Christian young people, this medium presents both a challenge for the future and a forum of expression for the convictions of their personal experience with a living Jesus Christ.





## Class "D" FM Facilities Survey

A recent sampling of IBS broadcasting facilities questionnaires on 10-watt stations gives some interesting insights into their technical capabilities. Ninety-two records on Class D stations were available, although, due to varying age, not all were complete in every category checked.

Table A shows the transmitter types encountered. A few of them are basically exciters and may have

required special type-acceptance measurements. The heavy predominance of the Gates transmitter seems due to its having been continuously available for at least 10 years and relatively low price.

Table B shows the numbers of antenna bays in use. The popularity of antennas of only one or two bays is viewed as unfortunate; four or more would be far better. Antennas ran between 39 and 450

feet above the ground, with a median of about 90. Height above average terrain, a less meaningful figure, ran between -264 and 1800. Out of 74 stations, 59 used only horizontal polarization. This is not necessarily desirable.

Table C gives the antenna types present, and Table D the feedlines. There seems to be excessive reliance on the RG-type lines in view of their poor performance when



moisture invades the dielectric.

Table E shows what compressors and limiters were in use. Of 48 stations sampled, six used no audio processing at all, a regrettable circumstance. Fourteen used limiting alone, eight employed compression alone, and 20 used both.

Out of 89 stations checked, only five operated stereo. Of 52 stations, 21 had their transmitters remote from the studios.

Table A

Transmitter Type	No.
Gates BFE-10	55
CCA FM-10	13
ITA FM-10	5
REL 706	4
Moseley LPT-10	3
GE Phasitron	2
RCA BTE-10	1
Collins A830Z (exc.)	1
Collins 738A	1
(Composite)	1
Marti M-10	1
Visual DFM-10	1
Wilkinson FM-10	1

Table B

Bays	No.
1	24
2	50
3	1
4	5
6	1
8	2

Table C

Antenna Type	No.
Gates FM-22	29
Gates FM-11	11
Jampro JA-( )-AE	6
Gates FMX-( )	5
Marti EA-1	5
CCA/Shively 6602	7
(Composite)	3
Andrew 1302-( )	2
CCA/Shively 6812	2
CCA FMH-E	1
Collins 37Q	1
Communication Products	1
Gates M-3429	1
GE BY-( )	2
Jay Tapp	1
Kemp	1
Kentronics HFM-1	1

RCA  
REL

Table D

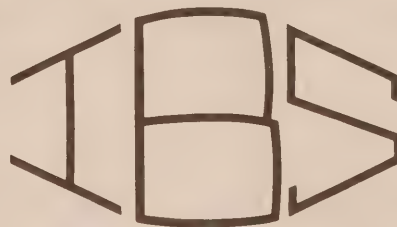
Feedline Type	No.
RG-8	18
RG-9	1
RG-13	1
RG-17	2
RG-58	1
Heliac — 1/4"	1
Heliac — 1/2"	1
Heliac — 7/8"	1
Heliac — misc.	8
Hard line — 7/8"	1
Hard line — 3"	1
1/2" Foam	7
3/8 Prodelin Spiroline	1
348-509 Foamflex	1
Phelps-Dodge FXCC-12-50H	1

1  
1

Table E

Compressors	No.
CBS Audimax	12
Gates Level-Devil	7
Gates Sta-Level	3
Altec 436A	1
ITA	1
RCA BA-47	1
Teletronix	1
Limiters	No.
CBS Volumax	17
AM-864/U	3
CCA LA-ID	3
Collins 26W	1
Fairchild 666	2
Gates Solid Statesman	1
RCA BA-6	1
RCA BA-46	1
RCA 86-A1	1

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OFFICIAL COLLEGE RADIO JEWELRY



# AN INTERVIEW WITH THE HONORABLE ROBERT E. (BOB) LEE

*by Steve McIntyre*

(Ed. note: This interview was conducted during the recent winter meeting of the Oklahoma Broadcasters Association.)

**SM:** Commissioner Lee, recently the FCC has been studying the feasibility of licensing and rule making for Carrier Current FM stations. Is the Commission still considering action on these broadcasters?

**Lee:** In my opinion, I don't see any need to license carrier current stations at this period of time and as far as I know we have no plans in

this direction at this time.

**SM:** Over the years, many bills have been introduced in Congress to extend the license renewal period for stations to five years. Do you think the renewal period will ever be extended?

**Lee:** This question comes up every renewal year and right now I can't foresee the Congress extending the renewal period in the near future. There are members of the Congress who are in favor of extension, but there are quite a few who are adamantly against it, too. No, I

don't think there will be an extension of the period any time soon.

**SM:** There is a growing feeling around the country that Educational FM stations should conduct surveys to ascertain community needs. Do you agree with this idea?

**Lee:** There is no specific requirement for these stations to do this. I happen to think it's a pretty good idea. You ought to be aware of your audience and know what people want. Yes, I think studies should be done by these stations.

**SM:** Do you feel that all of these stations should have to do studies, including the small 10-watt station that is mainly just a training ground for broadcasting students?

**Lee:** I assume you mean all of those in a particular community. I don't think it would be necessary for the training stations to do it, the others could probably cooperate.

**SM:** Do you feel that Educational stations should have a longer license renewal period than other broadcast stations?

**Lee:** I've never heard that question before. I don't see any grounds for a distinction. I think they should probably be the same as their commercial brother.

**SM:** What do you see in the future for Educational stations?

**Lee:** I think there will be a tendency to require the ascertainment of community needs, the same as the commercial station. We've always encouraged Educational stations, we'll continue to. I think we may have some troubles with them. You know they're a little more independent than commercial stations. I'm not so sure they shouldn't be a little more experimental. I know we would have more tolerance for an Educational station than we would a commercial station on the theory of experimentation. We are a little concerned about complaints from the public. I'm not aware of any at the moment, but I'm sure they will follow.

**SM:** Thank you Commissioner Lee.



# JOURNAL OF COLLEGE RADIO

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 A&M  
 MCA  
 ATLANTIC  
 COLUMBIA  
 ABC  
 MERCURY  
 CHARISMA  
 ATLANTIC  
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 HELLO IT'S ME  
 WOLD  
 YOU'RE 16  
 MUST BE LOVE  
 CAN'T SAY NOTHING  
 STAR  
 LOVE, REIGN OVER ME  
 THE JOKER  
 AMERICAN TUNE  
 YOU'RE SO UNIQUE  
 HANDFUL OF DUST  
 MIDNIGHT RIDER  
 LAST TIME I SAW HIM  
 FOR YOUR LOVE  
 APPLE OF MY EYE  
 JESSICA  
 LOVE SONG  
 I SHALL SING

LOGGINS & MESSINA  
 JIM CROCE  
 TODD RUNDGREN  
 HARRY CHAPIN  
 RINGO STARR  
 JAMES GANG  
 CURTIS MAYFIELD  
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 WHO  
 STEVE MILLER BAND  
 PAUL SIMON  
 BILLY PRESTON  
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 GREGG ALLMAN  
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 A&M  
 ASYLUM  
 CAPRICORN  
 MOTOWN  
 REPRISE  
 APPLE  
 CAPRICORN  
 CAPITOL  
 COLUMBIA

## Break - Outs



HANGIN' AROUND  
 Edgar Winter Group  
 CDAL, Dalhousie College  
 Halifax, Nova Scotia

RAINBOW SONG—America  
 WMSU, Univ. of Southern Mississippi  
 Hattiesburg, Mississippi

DOO DOO DOO DOO DOO  
 Rolling Stones  
 WUVA, Univ. of Virginia  
 Charlottesville, Virginia



# Record Reviews

PICK ALBUM FOR FEBRUARY

TALES FROM TOPOGRAPHIC OCEANS

YES

ATLANTIC SD2-908



## ROD STEWART AND FACES LIVE

ROD STEWART MERCURY SRM 1-697

The electricity of Rod Stewart has always been an amazing fact of rock and roll. Rod has always been able to take an audience and shape them into any form he wanted to at his will. This "live" album more than proves that as Stewart and The Faces take you on a foot stomping, hand clapping tour of their own brand of R&R. This disc is already getting great airplay all over the country and should easily be a million seller.



## WILD TALES

GRAHAM NASH ATLANTIC SD7288

The vocal abilities of Graham Nash are easily evident throughout every album he has ever cut, and it is evident once again on this, his latest release. First with the Hollies, and then with C, S, N, & Y, Graham's voice is a thing of beauty and you would do your listeners a great favor by playing every single cut on this album as much as possible.



## ONE MORE RIVER TO CROSS

CANNED HEAT ATLANTIC SD7289

Canned Heat is the original boogie band! This album makes you get out of your chair and up on your feet and should do the same for all the campuses in this country. All cuts are great and should get lots of airplay.

## MANHOLE

GRACE SLICK GRUNT BFL-1-0347

The production trio of Slick, Kantner, and Freiberg have come up with another masterpiece. Grace Slick has always been one of the first ladies of rock music and she is just as brilliant now as she was a few years ago with a San Francisco group called The Jefferson Airplane. Grunt has done up side 1 especially for us, but don't be afraid to play side 2. The entire album is great.

### Other New Releases:

BACHMAN	TURNER OVERDRIVE II	MERCURY SRM-1-696
TALES FROM TOPOGRAPHIC OCEANS	YES	ATLANTIC SD 2-908
THE PHOSPHORESCENT RAT	HOT TUNA	GRUNT BFL1-0358
IT'S GETTING BETTER	ATLANTIS	VERTIGO VEL-1018
THE TAIN	HORSLIPS	ATCO SD 7039
CHARISMA DISTURBANCE	FAMOUS CHARISMA LABEL T551	
	VARIOUS ARTISTS	

Two record set will not be released in the U.S.A. Order from JEM Records, P.O. Box 362, 3001 Hadley Road, South Plainfield, N. J. 07080. Cost: \$3.00/per album.

# DISC NOTES

by Steve McIntyre

Either the U.S. Postal Service is slower than I thought or there are a lot of people out there in Radioland that agree with my November column. I have yet to receive any replies, yea or nay, and I thought I was stirring up a hornet's nest. I am ready to fight back and justify my opinion, so let's hear from you.

I don't know about the rest of you but I am getting great record service from most of the companies (especially Atlantic-Atco-Asylum, Capitol, UA, Mercury-Phonogram, London, Grunt, and A&M) and I would like to take this small space to give them a plug and a great big thank you for all their help and consideration. Without them, most of us wouldn't have anything to play, and I'm sure they would enjoy a thank you note from some of the other stations they serve.

Now I have another complaint to air and I hope that someone can help me with this serious problem. I cannot seem to get any response from the folks at Columbia Records to any of my inquiries or requests for promo records. If anyone out there is getting records from Columbia and is on good terms with them, please pass along the word that I am not hearing from them (surely a breakdown in communications).

While we're on the subject of record companies, I received a note from Allison Ames at Polydor Records informing me that they were omitted from the Industry Directory in September. A thousand pardons, please. The address for Polydor-Deutsche Grammaphon-Archiv is: Polydor, Inc., 1700 Broadway, New York, N.Y. 10019. Their promo policy is restricted but they do offer an annual subscription of 40 records for \$50.00.

I am still accepting stories, interviews, critiques, and reviews from contributing writers, so if you would like to see your name in print somewhere else besides the post office wall, let me hear from you. We are also running short on picture stories about your station, so get busy.

I hope you enjoyed last month's interview with The Edgar Winter Group. If you would like to see more of these interviews let me know and let my boss, Jack Deskin, know so maybe he will come up with some scratch for concert tickets.

And for those of you who keep sending your playlists to Mississippi, please note that we are no longer there. Address all correspondence to us in Oklahoma at Dept. of Oral Communications, Central State University, Edmond, Okla. 73034. If you send it to Mississippi it is two or three weeks old by the time it gets here. Keep playing that rock and roll and I'll see you next month!





# **INFORT**

**IBS NATION  
HOTEL STATL**

Dear Friends,

If you didn't make it to last year's IBS Convention in Washington, you blew it! As a forum for sharing ideas with other college broadcasters, professional broadcast executives and various other experts—it was a conference without equal. As an opportunity for making contact with record companies, equipment manufacturers and potential employers, it had few competitors. And so, it isn't hard to see why we say, "If you missed it, you really missed it!"

Now it's time to think about this year when it will happen all over again. And, whether you made it to Washington for VIEWPOINT '73 or not, we hope to see you in New York City at the Statler-Hilton Hotel from April 5-7, 1974, for INFORTAINMENT '74. As you can see from our tentative program, it'll be better than ever in all categories. And, if we are right in projecting a big increase in attendance, we'll also be offering you a wider forum for your ideas.

Get with it and send for your registration forms now. Remember, if you want to take advantage of our reduced early-bird rates, you have to be registered by December 15. That doesn't give you much time at all.

And, when you send off for your registration forms—how about dropping us a line with any suggestions you might have for improving our program or operations. We still have time to make changes, if enough of you want them. After all, this is **your** convention.

See you in April at INFORTAINMENT '74.



# WINMENT '74 →

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## FEE SCHEDULE FOR INDIVIDUALS

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Received by Dec. 15, 1973	\$19.00
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Received by Dec. 15, 1973	\$22.00
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(Note: a downwards adjustment and partial refund will be made on non-members who join IBS after paying for convention admissions.)

### PROFESSIONAL ATTENDEES (including faculty)

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Singles: \$20.00	Doubles: \$26.00
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We're working on a new feature for JCR. It'll be a series of guest editorials written by persons prominent in the broadcasting industry. We're having a bit of difficulty in lining up prospective contributors (like we keep sending out requests and not getting any replies, not even "no"), but as soon as we get one, you'll see it.



Another problem we're having is with some of you. The *Journal of College Radio* doesn't have a big budget and correspondents all over the country. It'd sure be nice if we did, and maybe someday IBS will increase our budget by a couple million dollars and we can have reporters all over the place. But until that happens, we'll have to keep on relying on member stations as we have in the past. All the features on stations that you've seen in this magazine were written and submitted by people who worked for those stations, or close to them. Some were sent at our request; others were sent in unsolicited.

As you have no doubt noticed, there are no station features this issue. The reason is simple enough: although we sent out requests for stories for our January issue, all but one of them were totally ignored. The only station that replied was WJRH of Lafayette College in Easton, Pa. The school was closed due to the energy crisis, but a feature on their operation will be appearing in a future JCR.

But the main point of this story is this: if there's no help from member stations, then there's no JCR. It's not my magazine, or Jack Deskin's or Steve McIntyre's, or even IBS'. It's your magazine, in every sense of the word. You subscribe to it. You support the organization that sponsors it. And we must rely upon you to provide us with features and photos about your stations.

We realize, of course, that not

## FOR WHAT IT'S WORTH...

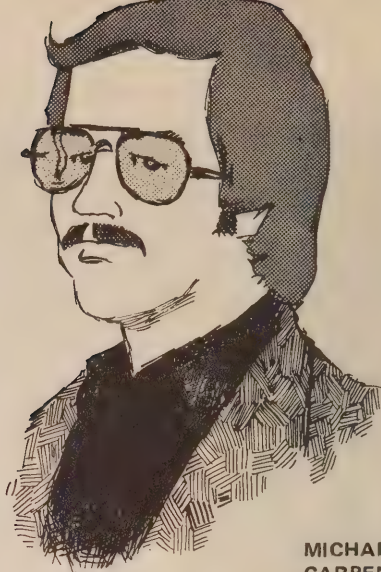
every station can provide such material. WJRH couldn't. But at least they let us know they couldn't, and that's important, too. If we send out a letter and don't get a response, we don't know if we're being refused, or if a story will be coming, or what. All we can do is sit around and wait until just before deadline, and then panic because we don't have anything to print as is the case with this issue, or we can send out dozens of letters and hope that by the law of averages three or four replies will come back in to us. At least if you write or call to tell us "no," we can start looking to some other source for copy. That's why it's important, if you receive a letter from us, to answer it within one or two days, either with a "yes" or a "no" so that we won't be left in suspense.

Of course, you don't have to wait until we send you a letter. If you send in an unsolicited story, we'll probably print it.

And those of you who have received letters concerning our March issue, *please* give us some sort of reply. It will be greatly appreciated.



Another matter that comes to mind here is the one of photographs. Stations have always been very helpful to us in this area, and we try to use as many pictures as possible of stations, their staffs, and facilities. But in the process of



MICHAEL  
CARPENTER

layout and printing, photographs tend to get a little worn around the edges. That's why we and so many other publishers cannot return photographs. (Keeping track of all of those photos is no easy process, either.)



Get out your November, 1973, edition of JCR. See that picture on the cover? It's Leopold Stokowski, adjusting stereo equipment in Washington's Constitution Hall. Further information to that effect can be found on page one. What you won't find on page one, though, is information about the antenna also pictured. And that's kind of a shame, since the original picture was sent for our new products section. The antenna is the model JSCP-3 FM broadcasting antenna. It's manufactured by the Jampro Antenna Company, a subsidiary of the Computer Equipment Corporation. The address is 6939 Power Inn Road, Sacramento, California 95828. The phone number is (916) 383-1177.



We're always open to suggestions about improvements or changes you'd like to see in our content and format. The address to write to is:

Michael Carpenter  
The Journal of College Radio  
Communications Center  
Central State University  
Edmond, Oklahoma 73034



# THE NUMBER ONE KILLER OF YOUNG AMERICANS IS YOUNG AMERICANS.



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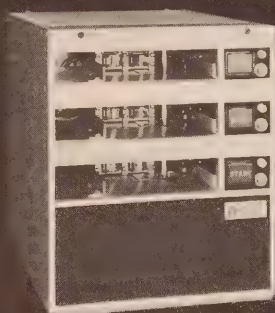
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STOP KILLING EACH OTHER.**





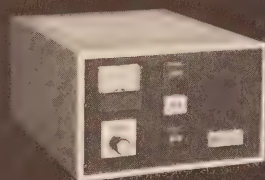
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# Engineering

Ludwell Sibley

## NOTES ON CLASS "D" FM

Class "D" FM stations have been appearing at a growth rate of about 10% per year, and there are now about 300 on the air. A great many new or carrier-current stations have found 10-watt FM to be a good medium, either in its own right or as a step toward high-power FM. This article details some of the considerations in planning and applying for a construction permit.

The requirements for high-power FM are so much more strict than for 10-watt operation that it makes little sense to apply for a Class A station of just a few hundred watts—for nearly the same effort and cost, 500 or 1000 watts are reasonable. This tends to accentuate the differences between Class D and high-power operations.

### GETTING HELP

The *IBS Master Handbook* (secs. 24.00-25.21; 67.00-67.90) contains an excellent summary of the procedures involved in dealing with the FCC. The writer can help out with specific questions that arise.

It appears unwise to expect any

help from FCC field offices, particularly when doing a frequency search. It is highly unlikely that the local personnel will be able to suggest a suitable channel, and they have been reported to say "no" on general principles when asked about availability of frequencies.

Consulting engineers can be located, in the absence of a more direct contact, by checking the listings in the "IEEE Spectrum," "Broadcasting," or *Broadcasting Yearbook*. The National Society of Professional Engineers upholds a code of ethics which limits public notices to "firm name, address, telephone number, appropriate symbol, name of principal participants and the field of practice in which the firm is qualified." Consulting engineers are thus forbidden to use advertising as such.

### FREQUENCY SELECTION

If the station is located in an area relatively free from FM channel congestion and without a Channel 6 TV station, the work of finding a frequency can be done by a reason-



ably skilled chief engineer. The assignment rules for 10-watt operation are Parts 73.501, 73.504, and especially the footnote to 1.573.

In congested areas, however, things get tougher. Fortunately, certain engineering tools are available in educational FM that are not allowable in commercial work. Directional antennas with up to 15 dB of discrimination are permissible, although the FCC will want pattern measurements that raise the cost considerably. Stations can be squeezed into hilly areas by showing that the intervening terrain blocks interference to and from another station. Methods to calculate the degree of blocking have been available for some time (1). In many cases a Class D station can go in on the third adjacent channel to a high-power station. With Class D operation there is no need to avoid channels 10.6 or 10.8 MHz from another station, and there are no minimum separation distances. With any FM system, part of the transmitter power can be put into vertical polarization to bring the theoretical interference contours in closer.

Part 73.515 gives special coordination instructions for stations to be located in a rectangular area centered roughly on Monterey, West Virginia, and extending about 60 miles in each direction. Other instructions are included for stations in northeastern Colorado.

Calculations of the contours of other stations must be based upon the stations' records as filed with the FCC (either Washington or the local field office). Field office records are not necessarily up-to-date, so if one doesn't mind showing his hand, it is possible to review the public file at the other station. Under Part 1.526, any Commission licensee must make a complete file available for public inspection. The file must be in an accessible public place in the community of license, open during normal business hours. The visitor need give no information other than his name and address. Failure to cooperate on the

part of the station is grounds for a letter to the Complaints and Compliance Division of the FCC, which will then invite the offender to mend its ways.

If things look at all sticky, it is prudent to have a professional consulting engineer make a frequency search. It will cost \$200 or \$300, but in many cases it is the only way to get a good answer. The search is valid only as long as a new applicant doesn't appear, of course, so a recheck before filing is in order.

If the transmitter is to be in an urban area, the true coverage area will not be a simple circle, but a cross-shaped zone aligned with the street pattern (2). This occurs because the buildings along a street act like the walls of a waveguide.

If a choice exists, the channel should allow conversion to higher power at a later date without interference to or from other stations. It has proven extremely difficult to persuade another station to change frequency to

accommodate a power increase, even with all costs paid.

The presence of a Channel 6 television station is troublesome. The FCC has been rejecting applications below 90 MHz and insisting on colocation of the FM station on the Channel 6 tower. This issue has been under consideration in Docket 19183 for some time.

The FCC has been working for some years to establish a Table of Allocations for educational FM, and is reportedly near that goal. Any such table will have obvious effects on channel assignments for new stations.

In tight-squeeze situations, one must follow the footnote to 1.573 and use the "F(50, 10)" chart to figure interfering signal strengths. This chart is not part of the Rules (!), having been released as part of a Commission order in 1961. It is available from Information Planning Associates, the official FCC duplicating service, or from the writer.

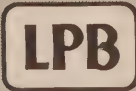


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 **GATES DIVISION**  
 Quincy, Illinois 62301, U.S.A.

The F(50, 10) chart does not apply below ten miles from the transmitter. For the short distances involved in 10-watt operation, the time variability disappears and the “F(50, 50)” chart will work with less than one decibel of error.

The coverage of a 10-watt station may be insufficient to reach surrounding communities. In this case an on-frequency “booster” or an off-frequency translator may provide satisfactory extension of coverage (3). The translator output is limited to one watt east of the Mississippi River and 10 watts west of it, but there is no limit on antenna gain. Requirements for measurements and operator licenses are quite reasonable. The rules for this service are 74.1201 through 74.1284. Translator applications are made on FCC Form 346. The latest edition of the type-acceptance list will show what equipment is suitable.

In towns where a CATV system carries FM radio signals, the new station should deliver a good signal at the cable head-end location. Otherwise it is necessary to use a telephone line and FM modulator to feed the CATV system. (This may ultimately be an advantage because of the possibility of advertising over the cable.)

## TRANSMITTER LOCATION

With luck, a high location can be found on-campus for the transmitter, or a tower can be built outside the studios. But if a height of a hundred feet or so is not attainable, it is desirable to go off-campus.

Sites held by commercial stations have obvious appeal. Real estate, access roads, power and telephone lines, and other expensive necessities are already settled, and there is no problem of tower lighting. Under Part 1.915, the CP application must show how the existing antenna structure is affected.

If the station is an AM, of course, a decoupling choke will be needed to bridge the FM feedline



across the tower base insulator. With a shared site, contract transmitter maintenance becomes feasible, although it deprives the Class D engineering staff of the experience and pride of caring for their own transmitter. Charges of at least \$300 a year for the program and control lines are in prospect unless an STL is used.

If one is considering renting tower space, UHF-TV stations generally need income worse than VHF, and are likely to be more reasonable.

If the station is planning to build its own remote site, it is good to check with the communications engineer for the local city or county. Such people tend to be knowledgeable about land availability, access roads and related details. They also know where to locate second-phone technicians.

It is important not to begin construction of transmitter building, tower, or equipment installation without a construction permit. Equipment can be ordered in advance, and some manufacturers will accept an order contingent upon a CP being granted for a surcharge of about five percent. Actual construction must be in accordance with the station license, even to details like the feedline length. The least time possible for granting of a CP is about six weeks under ideal conditions. Ninety days is typical for an uncomplicated case.

## TRANSMITTERS

The prospective Class D station has a few options on transmitters. New solid-state units are available for about \$2,400, with some price reductions expected in the near future. Tube models are about \$1,600. Transmitter manufacturers also sell reconditioned used units for about half the new price, although they don't publicize the fact. And a great many obsolete 10-watt exciters can be pressed into service. Dealers in used broadcast equipment (4) or local stations may be able to help here, although one should be satisfied that the equip-

ment is not being sold because of some obscure or intermittent defect.

In choosing between tubes and transistors, a philosophical problem presents itself. A tube unit can be expected to require maintenance work every three months or so, thereby developing familiarity with the circuitry. A solid-state unit is likely to run without much attention for years, but any failure will be protracted because the technician will be unfamiliar with the equipment. Such factors as the proximity of the manufacturer, what test equipment is available, what models the other stations in town use, and the skill of the engineer become important. In any event, there is not much point in perpetuating obsolete tube equipment that will lose resale value at an abnormal rate. A clear and complete instruction manual is essential. In fact, the quality of the manual is a good index of the thoroughness of the manufacturer's whole job.

The transmitter should be bought with three copies of the instruction book: one for the transmitter site, one for the chief engineer's files, and one for the faculty adviser to file away. This will preserve the resale value of the unit if the manufacturer (ITA or Standard, for example) goes out of business and the manuals are lost.

Stereo operation is not recommended for Class D use, and only about five percent of all 10-watt stations operate stereo. There is inadequate margin for the noise degradation, commonly estimated as 23 dB (5), that stereo brings. (If you want stereo like the big boys, get a Class A license!)

Certain older transmitters, particularly the Phasitron type, require scarce tubes. The 2H21 and GL-5593 Phasitrons are now \$470 apiece (6) from those few distributors which still handle them. However, a low-budget station can get on the air with one, deferring a new transmitter until the next year.



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*How about leakage, though?* Leakage is the relationship between wanted and unwanted information. You can prevent leakage in one of two ways: a) use a directional mike which will suppress unwanted sound from the back by some 26 dB, and keep the singer at a respectful distance to prevent cardioid bass boost, popping, and sibilants or b) move him in close to an omni mike with no coloration problems, and increase wanted signal by 26 dB and more!

**When should I use a figure-8 pattern...**

If I only want to use it for sound from one direction? Is there anyone out there who still remembers the RCA 44-BX ribbon and the decades of nothing but figure-8 patterns in the studio? The fact of the matter is, that you're likely to get less leakage from a figure-8 even with its "live back," than from a cardioid. One of the reasons is that a figure-8 is pure, meaning its pattern is almost identical at all frequencies, and the two dead sides are down more than 33 dB from front or back. A cardioid, on the other hand, changes its pattern more severely over the frequency range and has a front-to-back rejection of only about 26 dB. So why not switch to figure-8 and get a surprise!

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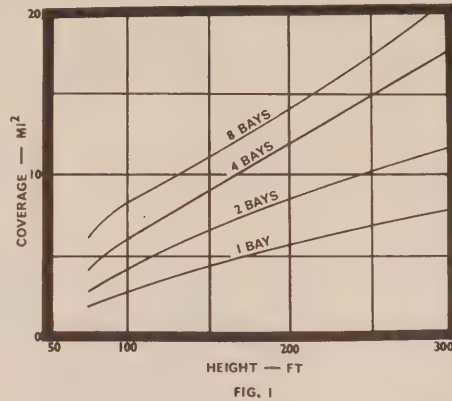
Commercial broadcasters may be interested in donating used equipment, particularly if reminded that gifts to an educational institution are tax deductible. The same is true of the rental value of transmitter locations and tower space if donated.

Transmitter types may be changed between the granting of a CP and the filing for a station license, just show the new model on Form 341, as long as the equipment is type-accepted.

### CHOOSING AN ANTENNA

The typical Class D station uses a two-bay antenna, at whatever height the speech and drama building happens to provide. This is a fundamental mistake which guarantees that the station will be barely audible beyond the campus boundary, and wastes good frequency spectrum besides. Any organization that is serious about running a radio station will seek a more effective facility.

For effective coverage, a multi-bay antenna and some height are essential. Figure 1 shows the



coverage areas enclosed by the 1-mV/m contour provided by one, two, four, or eight bays at various heights. It is adopted from Part 73.333 by assuming a 10-watt transmitter, one decibel of feedline loss, and flat ground. Note that under typical conditions, doubling the number of bays gives about 50% more coverage area. Doubling the height gives about 100% more

area. Doubling both (from two bays at 100 feet to four at 200 feet, say) triples the coverage.

With low-power bays at about \$250 each and towers at a few dollars a foot, there is little reason not to have an effective antenna.

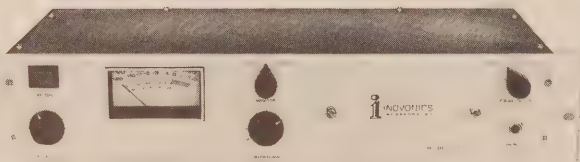
Not many class D stations presently use part-vertical or circular polarization. At least some vertical energy is desirable to fill in shadowed areas and to enhance reception on portable and car receivers.

With six or more bays, it becomes worthwhile to consider some electrical beam tilt and/or null fill. A consulting engineer can make recommendations along this line.

The feedline to be used will naturally affect the cost of the installation. Some hints on selection and installation have been printed previously (7). One can allow as much as one dB of line loss (80% efficiency) without

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MORE INFO? CIRCLE SERVICE CARD ITEM 46.



Table A

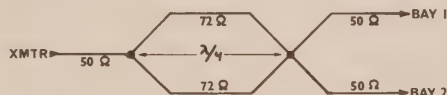
Cable	Length	Cost
RG-213 (8)	48	\$ 11
RG-218 (17A)	111	68
1/2" Foam Heliac	114	98
7/8" Foam Heliac	181	271
1-5/8" Foam Heliac	358	1,220

appreciably degrading the coverage area. Table A shows the lengths of various coaxial lines, each giving one dB at 90 MHz, and the cost for that length.

Lines that can be pressurized have the great advantage that as long as the line holds pressure, one knows that no water contamination is present.

Some antenna makers, Cable-wave, CCA, and Gates among them, sell low-power bays at about 40% of the price of high-power ones. These are a natural choice for Class D, and will accept a couple of hundred watts each if one goes to Class A operation later. Alternatively, one can home-make "halo" bays at low cost.

Power splitters are easy to home-make inexpensively. Figure 2

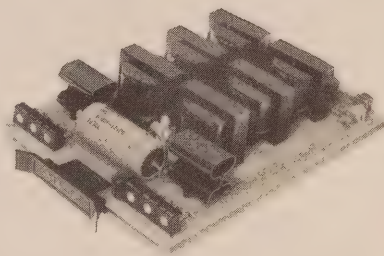


shows a simple splitter suitable for combining two 50-ohm bays. This splitter can be used in multiple to derive 4- or 8-element branching feeds.

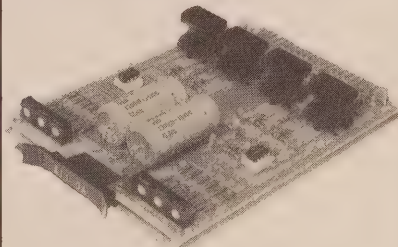
Antenna tuning and SWR considerations are not particularly critical at the 10-watt level. There is no danger of breaking down a transmission line or transmitter from excessive SWR. An SWR as bad as 4:1 will reduce the listeners' signal by only 2 dB, and the

# ROH for some good sound reasons

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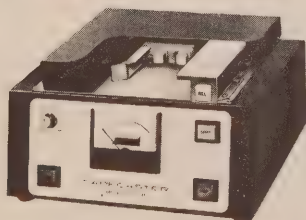
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**Roh Corporation**

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Norcross, Georgia 30071 Ph: 404/449-0873

MORE INFO? CIRCLE SERVICE CARD ITEM 48.



coverage area by about 19%. Thus, antenna deicers are not necessary except in exceptional cases.

## AUDIO PROGRAM LINES

If the transmitter will be located away from the studios, a telephone line is required. A 15-kHz equalized line runs \$36 per month within the local telephone exchange area. A nonequalized loop costs only \$10, but may or may not be equalizable to 15 kHz. Most across-the-campus loops are. As a good criterion, any loop whose loss measures 30 dB or less at 15 kHz, as measured through a 600:150 ohm transformer at the studio and a 150:600 transformer at the transmitter, can be equalized plus or minus one decibel to 15 kHz. Equalization methods were discussed in a 1972 JCR article (8).

A control loop will be needed for on-off control of the transmitter unless one buys a nonequalized audio loop and adds a "simplex" connection to derive an additional

ground-return control function from it.

## COMPRESSORS AND LIMITERS

Audio compression and limiting are even more important with Class D FM than with higher power. Only by maintaining adequate modulation levels can the station reach its full potential audience.

The limiter should preferably be a special FM type to guard effectively against overmodulation on high-frequency peaks. A conventional AM type can be pressed into service by locating it between the preemphasis network and the transmitter, or by adding an RC high-frequency-boost network with 75-microsecond time constant to its level detector circuit.

## TRANSMITTER MONITORING

The frequency and modulation level of the transmitter must be checked periodically. If a commercial monitoring service is not within listening range and other

frequency measurement means are unavailable, it will be necessary to buy a frequency counter or monitor. The transmitter meters alone do not guarantee correct operation. On at least one transmitter, the meters can show normal phase-lock while the transmitter is 300 kHz off-frequency. Another thing to be wary of: monitors using a 200-kHz IF, like the H-P 335, will show zero frequency error if the transmitter is off by exactly two channels, like 89.7 instead of 90.1 MHz.

A modulation monitor can be improvised by connecting a VU meter to an FM tuner and calibrating against other stations.

(The fact that the transmitter is type-accepted is no indication that it is a good design or that it operates within the Rules. It simply means that the manufacturer once got a prototype to work satisfactorily and was able to document the fact. Hence the need for adequate monitoring.)

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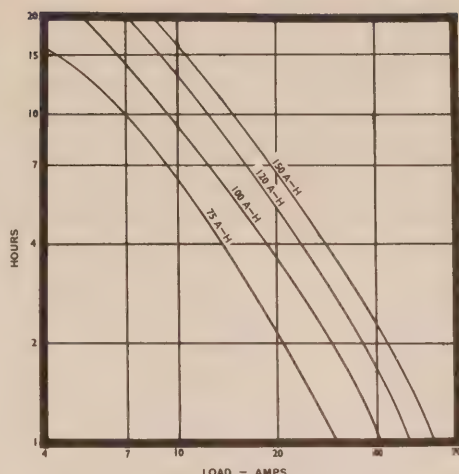
## EMERGENCY POWER

It is unusually easy to provide standby power at the 10-watt level. A good-sized car battery and 117-volt inverter will keep a tube transmitter on the air for about five hours, and a solid-state one for about 18. If essential studio equipment is protected similarly, the station becomes a valuable community resource during emergencies.

For planning a standby power system, Figure 3 shows the current-time ratings of typical lead-acid batteries of various ampere-hour capacities.

## MAINTENANCE PERSONNEL

In addition to operators with third class licenses to run the station, the Class D station needs a second or first class licensee to perform transmitter maintenance. If the station or school staff doesn't contain a licensed technician, it becomes necessary to contract out the work at considerable cost. In



some areas a commercial broadcast maintenance firm is available. In others, it is necessary to find an outside engineer. Likely people are engineers at other stations, retired broadcast engineers, telephone microwave technicians, and mobile radio repairmen (CB, police, taxi, or telephone company). It is probably wise to pay a monthly retainer fee so as to assure prompt attention when a failure occurs.

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Lou Burroughs is widely known for his pioneering work with Electro-Voice and is one of the universally recognized experts in the field. He helped design and develop many of the microphones which made modern broadcasting possible. Lou Burroughs knows microphones inside out. This book is based on his many years of research, field studies and lectures given throughout the world.

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## FUNDING CONSIDERATIONS

In raising funds (from alumni, say) it is good psychology to solicit donations contingent upon the CP's being granted. The prospective donor is much more likely to sign up if he thinks there's a good chance that his pledge won't be collected.

The record low cost for getting a Class D station on the air, including studios, is about \$500. The station in question collected a large assembly of old equipment and even resorted to such heroic measures as home-made turntable arms.

The FCC expects each applicant to be properly funded to complete and operate the station. Form 340 asks some rather specific questions along this line.

## ADMINISTRATIVE MATTERS

Be sure to use the latest editions of Forms 340 and 341 (they're changed from time to time). It is

safer to get them from the FCC in Washington than a field office.

It is important to get the application right the first time. Defective applications are returned for correction, and in the interim someone else may file for the channel or an adjacent frequency. The school's legal staff will want to scrutinize the application; after all, the Board of Trustees is usually the actual licensee. But attorneys aren't trained to detect errors in the engineering filing.

Be sure to check for typographical errors on any document from the FCC, like erroneous geographical coordinates. Any mistake becomes your problem when the inspector comes around. In case of an error, a polite letter should suffice to have the document re-issued.

Remote control authorization is necessary if the transmitter is out of the studios or even out of sight

of the board operator.

Lighting may be necessary if the antenna is more than 20 feet above an existing structure. In such cases, an aeronautical showing is required on the CP application, with possibly a filing of FAA Form 7460-1.

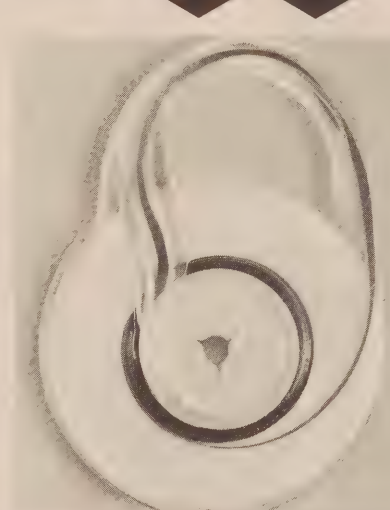
Class D stations are normally assumed to operate at 100 feet above average terrain. If the new station will be higher, it is good to get that fact into the record by including the radial study in the engineering filing. This buys protection against interference from an outside station.

As far as the preparation and signing of the technical portions of Forms 340 and 341 goes, the FCC does not require specific educational or licensing qualifications of the person doing the work. However, California law (9), and apparently that of other states, makes it unlawful for any non-registered engineer to use the titles

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“consulting engineer” or “professional engineer.” To avoid legal complications, it would be wise to stick to “technical director” when completing the forms.

REFERENCE MATERIAL

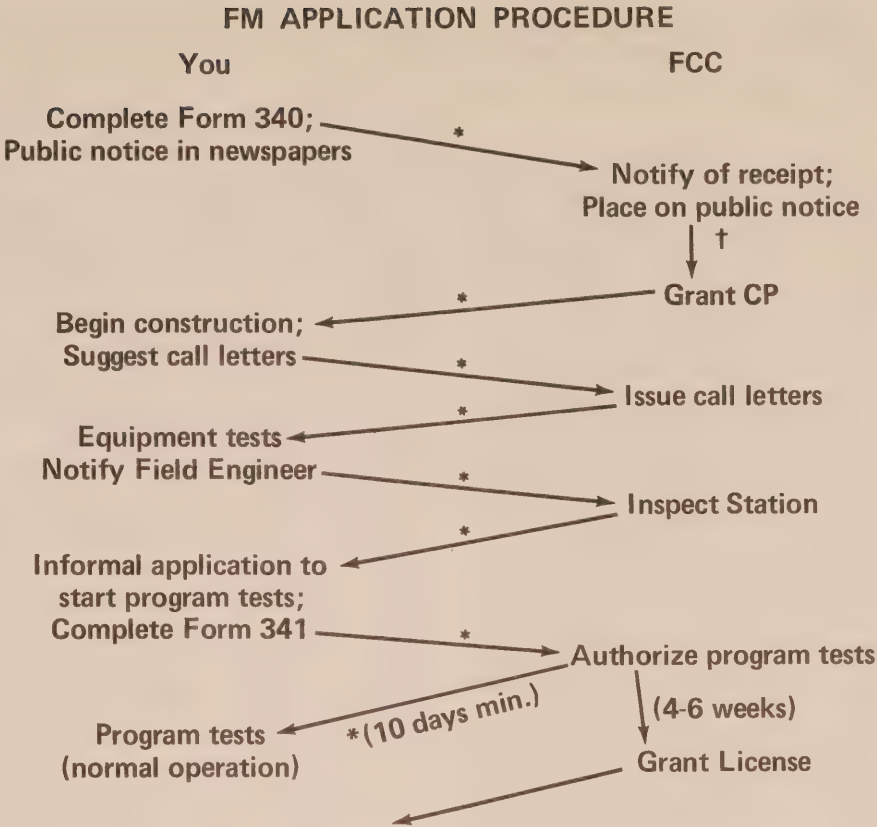
An applicant needs the following material:

Volumes I and III of Federal Communications Commission Rules and Regulations, available for \$15 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. This buys subscriptions to Parts 0, 1, 17, and 73, among others. Allow at least six months for delivery. (It is interesting to note that the cost of a full set of FCC Rules has more than doubled since 1964.) While awaiting delivery, one can find the Rules at a local station, an FCC field office, some Department of Commerce offices, or a law library (although library copies may not be up-to-date). See Chapter 1 of Title 47 of the Code of Federal Regulations.

Forms 340 and 341 (six copies) from a field office or the Federal Communications Commission, Washington, D.C. 20554. Part 0.121 of the Rules gives the addresses of all field offices.

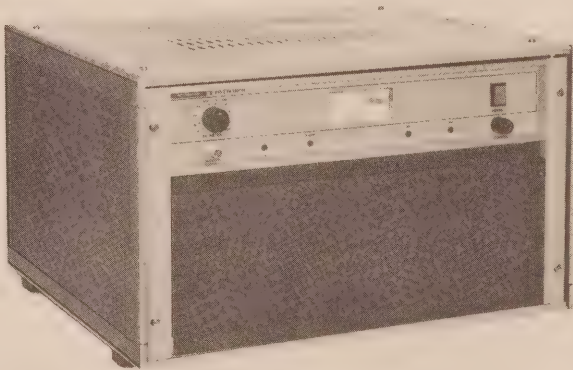
FAA Sectional Aeronautical Chart or (whenever possible) the Instrument Landing Chart for the local airport (five copies). Instrument approach charts are available for \$1 apiece from Jeppesen & Co., 8025 E. 40th Ave., Denver, Colorado 80207, or from local flight suppliers. The sectional chart is ordinarily used only when the station is 10 or more miles from the airport. Mark in any new airstrip built since the map was issued.

U.S. Geological Survey topographic quadrangle maps (four copies) for the area within 15 miles for the proposed transmitter location. Maps, map indexes, and order forms are available from the U.S. Geological Survey Map Office, 1200 Eads St., Arlington, Virginia 22202, or Federal Center, Bldg. 41, Denver, Colorado 80225.



\*Mailing and handling time.  
†31 days legal minimum; 60-90 days normally, if uncontested.

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B-910T transmitter

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**EASILY MAINTAINED** with plug-in modular design  
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MORE INFO? CIRCLE SERVICE CARD ITEM 55.

transmitter



Topographic map sheets are also available from some large stationers.

The following literature may prove helpful:

Volume XI, Federal Aviation Regulations, and/or FAA "Obstruction Marking and Lighting Advisory Circular 70/7460-1," from the Superintendent of Documents, \$2.75 and \$0.60 respectively.

Administrative Bulletin No. 1, "Printed Publications"; Information Bulletin No. 1-B, "How to Apply for a Broadcast Station"; and "The Public and Broadcasting: A Procedure Manual," all obtainable from the FCC in Washington. The "Procedure Manual" was printed in the Federal Register for September 29, 1972, and is planned for inclusion in the *Master Handbook*.

"Radio Equipment List — Equipment Acceptable for Licensing," available for inspection at FCC

offices, or purchasable for about \$25 from Information Planning Associates, 310 Maple Drive, Rockville, Maryland 20850. The writer has access to this list, which is reissued bimonthly.

"Sex and Broadcasting - A Handbook on Starting Community Radio Stations," \$2.15 from KTAO, 5 University Ave., Los Gatos, California 94070.

"Broadcast Service List (AM, FM, TV)" and "Pending Applications List - FM," from K&E.

"FM Station Atlas," \$2.50 from FM Atlas Publishing Co., Box 24, Adolph, Minnesota 55701. This listing is quite convenient for quick-check frequency searches. It lists the city of license, not the actual transmitter location, and is thus not authoritative for critical interference cases.

#### References

1. K. Bullington, "Radio Propagation Fundamentals," Bell System Technical Journal,

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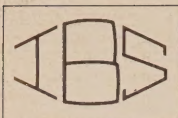
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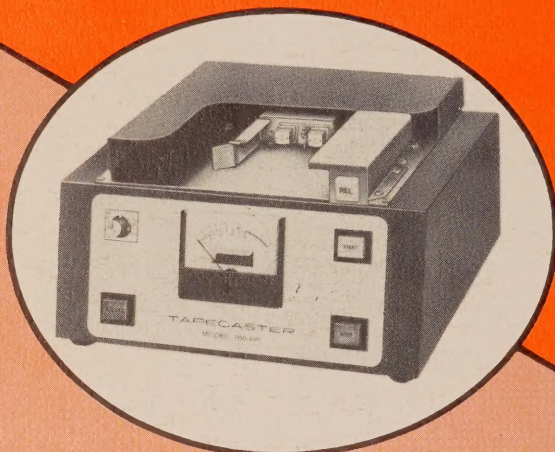
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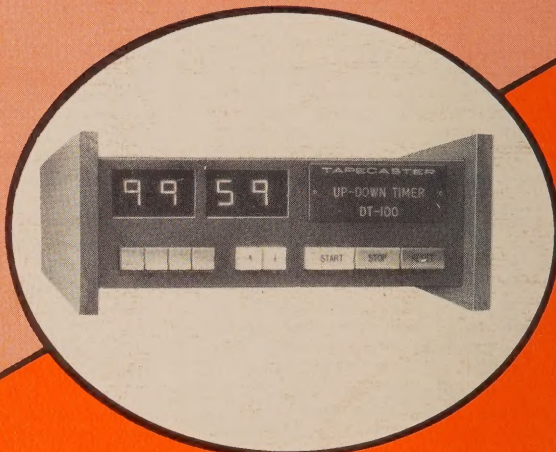
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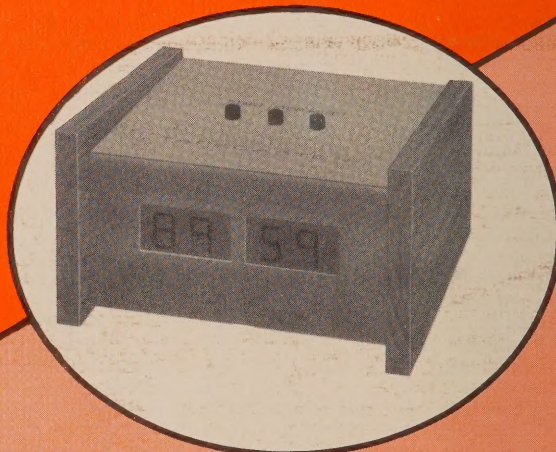
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